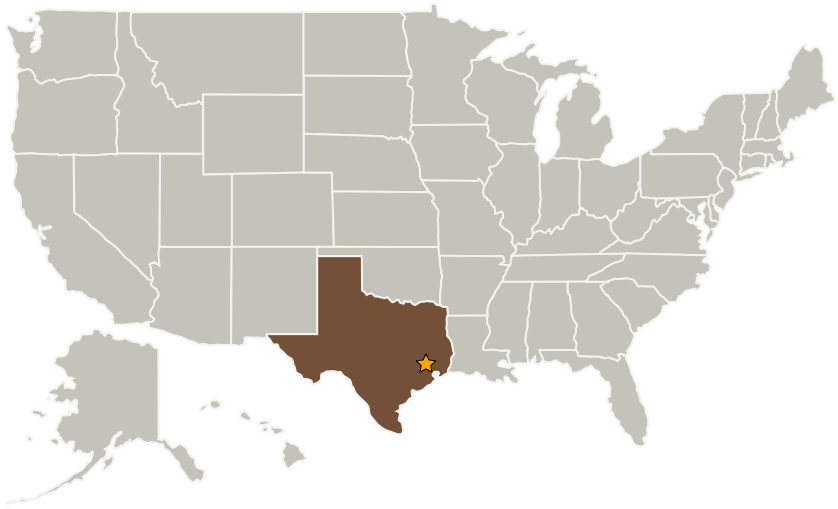
Compact, Lightweight, Efficient Cooling Pump for Space Suit Life Support Systems, Phase I

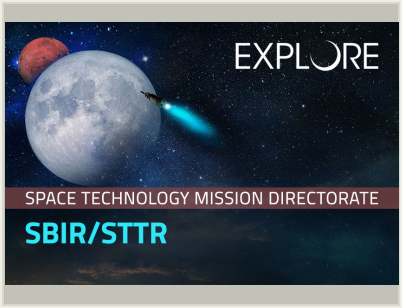
Completed Technology Project (2008 - 2008)

Project Introduction

With the increasing demands placed on extravehicular activity (EVA) for the International Space Station assembly and maintenance, along with planned lunar and Martian missions, the need for increased human productivity and capability becomes ever more critical. This is most readily achieved by reduction in space suit weight and volume, and increased hardware reliability, durability, and operating lifetime. Considerable progress has been made with each successive generation of space suit design; from the Apollo A7L suit, to the current Shuttle Extravehicular Mobile Unit (EMU) suit, and the developmental I-Suit and Mark III suits. However, one area of space suit design which has continued to lag is the fluid pump used to drive the water cooling loop of the Primary Life Support System (PLSS). Conventional electric motor-driven fluid pumps are heavy, bulky, inefficient, and prone to wear. A new pump type is needed. Lynntech proposes to further reduce the size, weight and power consumption of its long-life, low-power, compact, lightweight, efficient electrochemically-driven pumps, which will allow their use in the next generation space suit.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Lynntech, Inc.	Supporting Organization	Industry	College Station, Texas

Primary U.S. Work Locations
Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Roger Van Boeyen

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.2 Extravehicular Activity Systems
    - TX06.2.2 Portable Life Support System